



# Shore Power (Cold-Ironing) Regulation

Shore Power Workshops  
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California Environmental Protection Agency



Air Resources Board

1

## Questions Via E-mail

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2

## Topics

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- ♦ **Introduction**
- ♦ Cost Effectiveness
- ♦ Draft Regulation

3

## Introduction

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- ♦ Need for reductions at ports
  - Goods Movement Emission Reduction Plan
  - Diesel Risk Reduction Plan
  - South Coast SIP
  - AB 32

4

## Introduction (Continued)

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- ♦ Goals
  - Reduce hotelling emissions by 80 percent
  - Affect all ports and all types of ships
- ♦ Five workgroup meetings
- ♦ At-Berth Ocean-Going Vessel Regulation
  - Focus on container, passenger, and reefer
  - Other ship categories will be considered in future rulemaking

5

## Topics

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- ♦ Introduction
- ♦ **Cost Effectiveness**
- ♦ Draft Regulation

6

## Cost Effectiveness Methodology

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- ♦ Capital Costs
  - \$1.5 million per ship
  - \$5 million per berth
  - \$15 million for utility costs
- ♦ Labor
- ♦ Electrical cost versus distillate costs

7

## Cost Effectiveness Methodology (Continued)

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- ♦ Growth Factors from 2006 to 2014
  - Container ships 45% larger and 40% more visits
  - Passenger ships 36 to 95 percent more visits, depending upon port
  - Reefer ships 15 to 105 percent more visits, depending upon port

8

## Cost Effectiveness Methodology (Continued)

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- ◆ Growth Factors from 2006 to 2020
  - Container ships 55% larger and 75% more visits
  - Passenger ships 72 to 220 percent more visits, depending upon port
  - Reefer ships 27 to 250 percent more visits, depending upon port

9

## Cost Effectiveness (Continued)

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- ◆ Costs expressed as 2006 dollars
- ◆ Overall costs: \$1,700,000,000
- ◆ Components of costs
  - 78 berths at six ports
  - 750 ships initially and 700 replacement container ships

10

## Cost Effectiveness (Continued)

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- ♦ Emission Reduction (2009-2020)
  - NO<sub>x</sub>: 61,700 tons
  - PM: 1,100 tons
  - CO<sub>2</sub>: 3,100,000 tons
- ♦ Overall cost-effectiveness
  - NO<sub>x</sub>: \$12,500 per ton reduced
  - PM: \$700,000 per ton reduced

11

## Cost Effectiveness (Continued)

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- ♦ NO<sub>x</sub> cost effectiveness by terminal
  - Container: \$11,000 to \$32,000  
(POLA/POLB)
  - Container \$6,000 to \$70,000  
(Oakland)
  - Passenger: \$9,000 to \$25,000
  - Reefer: \$22,000 to \$30,000

12

## Cost Effectiveness (Continued)

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- ♦ PM cost effectiveness by terminal
  - Container: \$400,000 to \$1,100,000  
(POLA/POLB):
  - Container \$200,000 to \$2,500,000  
(Oakland)
  - Passenger: \$300,000 to \$870,000
  - Reefer: \$850,000 to \$1,100,000

13

## Topics

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- ♦ Introduction
- ♦ Cost Effectiveness
- ♦ **Draft Regulation**

14

## Draft Regulation

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- ♦ Applicability
  - Container ships
  - Passenger ships
  - Reefer ships
- ♦ Exempt
  - Government vessels
  - Steamships

15

## Draft Regulation (Continued)

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- ♦ Two major compliance options for ship fleets
  - Limited auxiliary engine operation
  - Emission reduction option

16



## Draft Regulation

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- ◆ Fleet

- Vessels visiting a California port
- Owned or under direct control

- ◆ Terminal Lessee

- Leases property from port

17

## Draft Regulation

(Continued)

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- ◆ Limited auxiliary engine operation

- 50% visits by 2014
- 80% visits by 2020

- ◆ Pro

- Simple to implement
- Simple recordkeeping

- ◆ Con

- Must have utility power available at the berth

18

## Draft Regulation

(Continued)

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- ♦ Emission reduction option
  - 50% emission reduction by 2014
  - 80% emission reduction by 2020
- ♦ Pro
  - Provides flexibility
- ♦ Con
  - Significant recordkeeping

19

## Draft Regulation

(Continued)

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- ♦ Examples of projects for emission reduction option
  - Shore-power different group of ships
  - Distributed Generation for electrical power
  - Alternative control techniques

20

## Draft Regulation

(Continued)

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- ♦ Requirement for shore power
  - Limited auxiliary engine operation
    - Use grid power
    - Alternative source that is as clean central station power plant equipped with BACT

21

## Draft Regulation

(Continued)

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- Emission reduction option
  - Before 2014, emissions no greater than a spark-ignited engine manufactured to current standards
  - CO<sub>2</sub> emissions no greater than natural gas resources used by utility
  - After 2014, spark-ignited engine equipped with BACT

22

## Draft Regulation

(Continued)

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### ♦ Terminals

- Must provide necessary infrastructure for vessels satisfying 2014 and 2020 requirement
- Plan document due in 2010 to Executive Officer indicating how requirement is satisfied
  - Must work with utility, port, and carriers

23

## Proposed Revision

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### ♦ Early implementation

- Affects terminals using non-grid based approach
- Phase in implementation from 2010 to 2016

24

# Contacts

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- ◆ **Webpages:**

Shore Power:

[www.arb.ca.gov/ports/shorepower/shorepower.htm](http://www.arb.ca.gov/ports/shorepower/shorepower.htm)

